CRISPR

Weather & In-field monitoring

Integrated Pest Management

Profit Mapping

Variable rate seeding & fertilizer

Nutrient Cycling

Genetic selection

In-season imaging

Water Cycling
Integrate Tools for Soil Health

Expanding Network

Cover crops
Nutrient Management
Tillage

Precision sampling

Economics

Soil sampling

Crop growth

Yield

Nutrient Management
Tillage
SHP Data Set

- **135** farms across **14** states

- Each farm
  - **165** measurements or metrics annually

- Crop input and management: **260 site years**
- Aerial imagery: **3+ years**
- Strip-level yield points: **1,942**
Texture Classes

Textural triangle used in determining soil texture. Soils with different properties of sand, silt and clay are assigned different classes. Adapted from: USDA-NRCS

https://soilhealth.cals.cornell.edu/
Corn

Aggregate Stability

WHC

OM

Active Carbon

$r^2 = 0.0787$

$r^2 = 0.9061$
What is aggregate stability?

• Aggregate stability is a measure of how well soil aggregates resist disintegration when hit by rain drops. – Cornell Manual

• How strong is the house you are building for your crops to grow in?

• If the walls (aggregates) are weak, there aren’t spaces for your plants to grow and access nutrients, water, and air that they need to grow
Should I manage for Aggregate Stability?

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>clay loam</td>
<td></td>
</tr>
<tr>
<td>loam</td>
<td></td>
</tr>
<tr>
<td>sandy loam</td>
<td></td>
</tr>
<tr>
<td>silt loam</td>
<td></td>
</tr>
<tr>
<td>silty clay</td>
<td></td>
</tr>
</tbody>
</table>

The graph shows different soil types and their corresponding ranges.
Aggregate Stability in the Major Soil Texture Classes for Illinois

With Corn Yields
What is Organic Matter?

- The carbon based material that is derived from living organisms

- % OM is determined by the mass of oven dried soil lost on combustion in a 500°C furnace
Should I manage for increasing my Organic Matter?
Organic Matter in Major Soil Texture Classes in Illinois

With Corn Yields
Automated Field Integration

*Investing in the Grower Experience*

- Automate data collection
- Automation of soil sampling
- Mobility
- Seamless lab data transfer
- Value added scenario analysis
How to get involved:

Email: soilhealth@ncga.com

Website:
soilhealthpartnership.org

Twitter handle: @SoilPartners

Facebook